CLAIMS

1. An X-ray topographic system comprising:

an X-ray generator for producing a beam of X-rays directed towards a sample location; and

a detector positioned to receive X-rays deflected by a sample at the sample location, the detector comprising an electronic X-ray detector having an array of pixels corresponding to the beam area at the detector.

2. A system according to claim 1, in which the beam has a divergence of up to 20 milliradians.

3. A system according to claim 1, including an X-ray optic interposed between the X-ray generator and the sample location, and arranged to receive said beam and to transmit the X-rays as a substantially parallel beam.

4. A system according to claim 1, in which the detector is positioned to receive deflected X-rays transmitted through the sample.

5. A system according to claim 1, in which the detector is positioned to receive deflected X-rays reflected from the sample.

6. A system according to claim 1, in which the X-ray generator is adapted to produce a source spot size of 100 μm or less and has an exit window less than 20 mm from the target.

7. A system according to claim 6, in which the system resolution is about 25 μm and the detector is located 5 - 10 mm from the sample location.

8. A system according to claim 3, in which the X-ray optic is a lobster eye optic comprising a number of parallel, X-ray reflective plates.

9. A system according to claim 8, in which the plates are about 150 μm thick and are coated with gold.

10. A system according to claim 1, in which the detector is a charge coupled device.

11. An X-ray topographic apparatus comprising an X-ray topographic system according to claim 1, stepping means for producing relative stepwise motion between the system and a sample to be inspected, the step size being a function of the beam area, and image processing means for reading out the pixel data of the detector between successive steps.

12. Apparatus according to claim 11, in which the stepping means comprises an XY table movable with respect to the X-ray generator and the detector, and a pair of servomotors arranged to step the XY table in orthogonal directions.

13. Apparatus according to claim 11, in which the stepping means comprises a boule transport device

arranged to rotate and axially translate a boule with respect to the X-ray generator and the detector, and a pair of servomotors arranged to step the boule transport device in rotation and translation.

14. Apparatus according to claim 11, in which the image processing means comprises means for storing the pixel data output from each step, and means for combining data from successive steps to form a composite image.

15. Apparatus according to claim 11, in which the detector operates in raster scan, and the image for each step is derived by integrating a plurality of scanning frames.

16. Apparatus according to claim 11, in which the X-ray beam has sufficient divergence to produce doubling of the image at the detector, and in which the image processing means is operative to remove the effects of said image doubling.